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Claims

1. An optical disc information management method characterized in that when recording input information in an available area on a removable optical disc, a unique disc name assigned to said optical disc, information on the recording position, and a file name and 1 or more keywords pertaining to the aforementioned input information are recorded as management data on a specific recording medium to be used for management; when reading the information recorded on the aforementioned optical disc, at least the aforementioned file name or the aforementioned keyword is input as search data, and the aforementioned management data containing the file name or the keyword which matches said search data are retrieved from the aforementioned recording medium and displayed; and

the recorded information with the aforementioned file name input is then read from said optical disc based on the information on the recording position in the aforementioned recording medium for management upon confirming that the optical disc with said disc name input is currently mounted based on the file name and the disc name input.

2. The optical disc information management method recorded in Claim 1, characterized in that when recording the aforementioned input information on the aforementioned optical disc, the aforementioned management information is recorded on the aforementioned optical disc also.

3. An optical disc information management device characterized as being equipped with an input means for entering management data of various kinds;

a recording means that reads a unique disc name assigned to the optical disc currently mounted and information on the recording position and records said data read together with management data, which consist of a file name and 1 or more keywords input from the aforementioned input means, on a specific recording medium for management when recording input information on the optical disc;

a retrieval means that accepts at least the aforementioned file name or the aforementioned keyword input from the aforementioned input means as search data and retrieves the aforementioned management data containing the file name or the keyword which matches said search data from the aforementioned recording medium;

a display means for displaying the aforementioned management data retrieved by the aforementioned retrieval means; and

an information reading means that reads the recorded information with the aforementioned input file name from said optical disc based on the information on the recording position in the aforementioned recording medium for management upon confirming that the optical disc with the disc name input is currently mounted based on the file name and the disc name input from the input means when reading the information recorded on the aforementioned optical disc.

4. The optical disc information management device recorded in Claim 3, characterized as being equipped with a management data updating means that is capable of updating the contents of the aforementioned management data using the aforementioned input means; and that when the contents of the aforementioned management data in the aforementioned recording medium for management are updated, it rewrites the contents of the aforementioned management data recorded on the applicable optical disc upon confirming that the target optical disc to be updated is currently mounted.

Detailed description of the invention
Industrial application field

The present invention pertains to an optical disc information management method and an optical disc information management device that allows information recorded on an optical disc to be managed easily.

Prior art

Recordable optical discs have been used with optical disc recording devices. An optical disc of this kind has a high recording density and is thus capable of recording a large amount of information.

Problem to be solved by the invention

However, in the case of a conventional optical disc, once information is recorded, said recorded information cannot be rewritten. Also, there is the problem that retrieval of recorded information from the optical disc is relatively slower than with a magnetic disc. As such, optical discs are typically utilized only for recording and storing data read from image readers and TV cameras.

In addition, in the case of an optical disc device of this kind, when a file name assigned to recorded information is to be changed by means of additional recording, the following complicated operations must be performed subsequently if an operator has forgotten the name of the applicable optical disc.

That is, optical discs are taken out of an optical disc storage rack one by one, mounted on an optical disc recorder, and the disc names and the file names recorded on the optical discs are displayed on a display device for monitoring. Then, after having detected the disc containing an applicable file name by repeating said processing, the operator performs processing for changing the file name; the operations carried out by the operator become cumbersome. As such, the purpose of the present invention is to provide a method and a device for managing optical disc information by which the aforementioned problem can be eliminated in order to allow discs to be found easily.

Means to solve the problem

In order to achieve said goal, the first embodiment of the present invention is characterized in that when recording input information in an available area on a removable optical disc, a unique disc name assigned to said optical disc, information on the recording position, and a file name and 1 or more keywords pertaining to the aforementioned input information are recorded as management data on a specific recording medium to be used for management; when reading the information recorded on the aforementioned optical disc, at least the aforementioned file name or the aforementioned keyword is input as search data, and the aforementioned management data containing the file name or the keyword which matches said search data are retrieved from the aforementioned recording medium and displayed; and the recorded information with the aforementioned file name input is then read from said optical disc based on the information on the recording position in the aforementioned recording medium for management upon confirming that the optical disc with said disc name input is currently mounted based on the file name and the disc name input.

The second embodiment of the present invention is characterized in that when recording the aforementioned input information on the aforementioned optical disc in the first embodiment

of the present invention, the aforementioned management information is recorded on the aforementioned optical disc also.

The third embodiment of the present invention is characterized as being equipped with an input means for entering management data of various kinds; a recording means that reads a unique disc name assigned to the optical disc currently mounted and information on the recording position and records said data read together with management data, which consist of a file name and 1 or more keywords input from the aforementioned input means, on a specific recording medium for management when recording input information on the optical disc; a retrieval means that accepts at least the aforementioned file name or the aforementioned keyword input from the aforementioned input means as search data and retrieves the aforementioned management data containing the file name or the keyword which matches said search data from the aforementioned recording medium; a display means for displaying the aforementioned management data retrieved by the aforementioned retrieval means; and an information reading means that reads the recorded information with the aforementioned input file name from said optical disc based on the information on the recording position in the aforementioned recording medium for management upon confirming that the optical disc with the disc name input is currently mounted based on the file name and the disc name input from the input means when reading the information recorded on the aforementioned optical disc.

The fourth embodiment of the present invention is characterized in that in addition to the third embodiment, it is equipped also with a management data updating means that is capable of updating the contents of the aforementioned management data using the aforementioned input means; and that when the contents of the aforementioned management data in the aforementioned recording medium for management are updated, it rewrites the contents of the aforementioned management data recorded on the applicable optical disc upon confirming that the target optical disc to be updated is currently mounted.

Operation

In the first embodiment of the present invention, because the name assigned to an ordinary information file is recorded on a separate recording medium for management together with the disc name, the recording position information, and the keyword information when recording the input information on the optical disc, the file name can be retrieved and output by finding the keyword from said recording medium. As a result, it is no longer necessary to mount optical discs on the optical disc device every time a disc or a file needs to be found, so that the work performed by the operator for this operation can be reduced significantly. In addition, because a reference is made to the recording position information when reading the recorded information, the recording position information can be read more quickly than when reading

recording position information from an optical disc in the conventional manner, so that the recording information can be read more quickly than with the conventional example.

In the second embodiment of the present invention, because the management information is recorded on the optical disc as a backup copy, information storage stability can be further improved.

In the third embodiment of the present invention, because the method of the first embodiment is implemented in the form of a device, wherein an optical disc information retrieval function is added to an optical disc recording device used for mere recording/playback of information in the past, a variety of searches can be performed without changing discs so that the work performed by the operator for this operation can be reduced significantly.

In the fourth embodiment of the present invention, when a disc name on the recording medium for management is changed, the disc name of the optical disc itself is rewritten automatically when said optical disc is mounted, so that the operator no longer needs to find the applicable disc every time a disc name is changed.

Application example

An embodiment of the present invention will be explained in detail below with reference to figures.

Figure 1 shows the basic configuration of an embodiment of the present invention.

In Figure 1, 100 represents an input means for entering management data of various kinds.

In addition, 200 represents a recording means that reads a unique disc name assigned to the optical disc currently mounted and recording position information when recording input information on an optical disc and records said data read as management data in the form of file name and 1 or more keywords input from the aforementioned input means on specific recording medium 250 for management.

In addition, 300 represents a retrieval means that accepts at least the aforementioned file name or the aforementioned keyword input from the aforementioned input means as search data and retrieves the aforementioned management data containing the file name or the keyword which matches said search data from the aforementioned recording medium.

In addition, 400 represents a display means for displaying the aforementioned management data retrieved by said retrieval means.

In addition, 500 represents an information reading means that reads the recorded information with the aforementioned input file name from said optical disc based on the information on the recording position in the aforementioned recording medium for management upon confirming that the optical disc with the disc name input is currently mounted based on the

file name and the disc name input from the input means when reading the information recorded on the aforementioned optical disc.

In addition, 600 represents a management data updating means that is capable of updating the contents of the aforementioned management data using the aforementioned input means; and that when the contents of the aforementioned management data in the aforementioned recording medium for management are updated, it rewrites the contents of the aforementioned management data recorded on the applicable optical disc upon confirming that the target optical disc to be updated is currently mounted.

Figure 2 shows the system configuration of the present application example.

In Figure 2, 1 represents a central processing unit (CPU) which executes the control procedures shown in Figures 5-10 in order to carry out various kinds of control processing needed for recording/playing information to/from an optical disc. CPU 1 functions primarily as the retrieval means, the reading means, and the management data updating means.

In addition, 2 represents a keyboard serving as the input means for entering an operation command and information to CPU 1. In addition, 3 represents a display device serving as the display means for displaying information input to/output from CPU 1. In this example, a display device utilizing a cathode ray tube (CRT) is used.

In addition, 4 represents an optical disc recording/playback device which performs such processing as reading (playback) and writing (recording) information from/to an optical disc in response to a command sent from CPU 1. Conventional known configuration examples may be adopted as the mechanical configuration and the circuit configuration of optical disc recording/playback device 4. However, it is different in that storage addresses of the pieces of information recorded on the optical disc magnetic are stored using magnetic disc recording device 5 to be described later.

In addition, 5 represents a magnetic disc recording device serving as a recording means for recording directory information, such as the name of the optical disc, information storage addresses, and file names, on a magnetic disc. An instruction for writing the information is given by CPU 1. A recording device utilizing floppy disc or a nonvolatile memory, for example, may be used in place of a hard disc drive; and a desirable recording device may be selected based on the system size and the amount of information to be handled.

In addition, 6 represents an interface for receiving information, such as image information, from an external device and for transmitting image information read from an optical disc to the external device.

In the present example, image information is received from an image pickup device.

Figure 3 shows the address configuration of magnetic disc recording device 5 shown in Figure 2.

In Figure 3, the storage area allocated to 1 address of the magnetic disc for storing the recording data is divided into the following areas. That is, file name storage area 41, disc name storage area 42, shooting date information storage area 43, file address storage area 44, file size storage area 45, first to n^{th} keyword storage areas 46, area 47 for storing attribute information indicating the presence/absence of a request for changing a file name or the disc name, and area 48 for storing the disc name and the file names before change are provided.

When recording new information on the optical disc, the aforementioned pieces of information of various kinds are written to the corresponding storage areas as instructed by CPU 1. In addition, processing for retrieving information to be read from the optical disc and processing for retrieving the keyword information is also executed by CPU 1 based on the aforementioned pieces of information.

Figure 4 shows the address structure of the optical disc.

In Figure 4, the storage area of the optical disc is divided beforehand into directory area A and data area B. In directory area A, 51 represents an area for storing pieces of disc-related information, such as a disc name, a disc administrator name, and a disc creation date; 52 represents a blank area where a new disc name is added in. Also, the same pieces of information as those recorded on magnetic disc recording device 5 may be recorded on said optical disc so as to backup said magnetic disc recording device 5.

In addition, 53 represents an area for storing file names assigned to the recorded information. Also, 54 represents an area for changing a file name. Also, 55 represents an area for storing the storage address and the information size of the recorded information which corresponds to file name 54 on the optical disc (this will be referred to as directory information, hereinafter).

In addition, 56 represents an area for storing address information indicating the beginning of a writable blank area of each disc.

Although an address that may be read in data area B is detected based on the information stored in directory area 55 in the conventional example, the directory information stored in hard disc recording device 5 is used for reading data, and the information stored in directory area A functions as a backup copy of the directory information stored in hard disc recording device 5 of the present example. Furthermore, when an emphasis is to be placed on saving the memory capacity, there is no need to provide said directory information area 55 and file name storage area 53. Next, operations of the circuit shown in Figure 2 will be explained with reference to the flowcharts shown in Figures 5-10.

Figure 5 shows the main control procedure executed by CPU 1.

In Figure 5, as the system is powered on, a processing menu is displayed on CRT 3 (Refer to Figure 2) by CPU 1 (Step S100). In the present example, information write processing,

information read processing, information retrieval processing, and retrieval-related information registration processing are implemented; and the operator inputs desired processing selectively from keyboard 2. The control procedures Figures 6-10 are executed in response to this selective input.

In addition, when an optical disc is mounted on optical disc recording device 4 irrespective of an instruction from the operator, processing for automatically registering a new file name or a new disc name with the optical disc is executed in the form of an interrupt by CPU 1 based on the information stored in magnetic disc recording device 5 (Step S600).

Respective kinds of processing in the present application example will be explained below according to the control procedure shown in Figure 5.

When the operator selects to instruct recording of information (Step S200 in Figure 5), the control procedure transitions to the write processing procedure shown in Figure 6.

In Figure 6, a file name and file name search information, such as keyword information, input by the operator through keyboard 2 are received by CPU 1 and stored temporarily in a work register provided inside of CPU 1 (Step S202).

Next, CPU 1 instructs optical disc recording/playback device 4 to read the optical disc name. Then, the applicable write start address is read from the magnetic disc of magnetic disc recording device 5 based on the disc name read. Also, the disc name is displayed on CRT 3 (Step S203).

Next, the recording start address is sent to optical disc recording/playback device 4, and transmission permission is sent to an image pickup device via interface 6. Image information sent from the image pickup device is sent to optical disc recording device 4 via interface 6 and written to the optical disc sequentially by optical disc recording device 4 (Step S205).

Because this image information transfer processing and the write processing by optical disc recording device 4 are widely known, their detailed explanation will be omitted.

CPU 1 carries out the image information transfer processing and calculates the size of said information simultaneously.

At the point when the reception of the image information from the image pickup device is completed, the write start address is updated according to the size of the information; and the file name stored in the work register, the calculated information size, and the write address are sent to optical disc recording/playback device 4 from CPU 1.

As a result, the new directory information and the file name is created in directory area A of optical disc recording/playback device 4. Then, from the above-mentioned directory area of CPU 1, using the magnetic disc recording device 5, pieces of search-related information to be written to respective memory areas 41-46 shown in Figure 3 are sent in addition to the aforementioned directory information, and new file information is created on the magnetic disc.

Once the aforementioned write procedure is completed, the control procedure returns to Step S300 in Figure 5.

Next, processing for reading information from the optical disc will be explained.

When a recorded information read command and a file name to be read are input from keyboard 2 or an external device via the interface (Step S100 → S200 → S300), the procedure transitions to the control procedure shown in Figure 7.

In Figure 7, CPU 1 stores the input file name in the work register provided inside CPU 1, and it then reads the disc name from the optical disc (Steps S302-S303).

Once it is confirmed that the file name input is present in the optical disc currently mounted and in the magnetic disc by CPU 1 based on said disc name, the file name stored in the work register, and the file information in the magnetic disc (Step S304 → S305), CPU 1 reads the storage address of the applicable file name from the magnetic disc and reports the read address of the file information to optical disc recording/playback device 4.

Subsequently, the information read from optical disc recording/playback device 4 is input to CRT 3 and displayed there (Step S306 → S307).

Next, the information retrieval processing pertaining to the present invention will be explained.

When the operator selects retrieval processing using the keyboard while the menu screen is displayed, the control procedure of CPU 1 transitions to the control procedure shown in Figure 8 (Steps S100-S400 in Figure 5 → control procedure in Figure 8).

In Figure 8, first, a search menu formulated in advance is displayed on CRT 3 by CPU 1.

The search processing includes the following processing.

(1) Searching for a file name using an optical disc name

(2) Searching for a disc name using a file name

(3) Searching for a file name using keyword information

(4) Displaying a list of stored contents

For example, during a search using an optical disc name, the file name information with the same disc name as the disc name input by the operator is extracted from the hard disc by CPU 1 (Step S420 → S412). In addition, because a search using a file name or a keyword is different merely in that it is aimed at a different search target, the retrieval processing follows a procedure similar to that described above.

In addition, to display the list of stored contents, pieces of recorded information read from the magnetic disc starting from the beginning address are displayed on CRT 3 by CPU 1 (Step S450 → S451).

Even when the operator has forgotten a given file name, the desired file name can be found by entering keywords of various kinds, the disc name, and information related to the file name. In addition, a desired file name can be recalled easily simply by looking at the list of the file names in the hard disc.

Next, the registration processing of retrieval-related information will be described.

When the operator selects registration processing using while the menu screen is displayed (Step S100 → S200 → S300 → S400 → S500 in Figure 5), the control procedure transitions to the control procedure shown in Figure 9.

Figure 10 [sic; 9] shows the flowchart of the menu screen displayed on CRT display device 3. Pieces of registerable information, that is, pieces of keyword information to be registered for the optical discs and messages indicating changes of information of various kinds, are displayed along with numbers (Step S502).

When the operator enters to register keyword information from keyboard 2 using the corresponding number followed by a file name, the applicable disc name, and keywords, CPU 1 reads the recorded information with the input disc name and the file name from the magnetic disc and confirms that no keyword information identical to the input keyword information is present in said recorded information. Then, it rewrites and registers recording information obtained by adding the entered keyword information to the recorded information read at the same address in the magnetic disc (Step S503 → S504 → S505).

For example, when revision of a file name is selected, and the file name before the revision, a new name for file to be revised, and a name for identifying an optical disc are input via keyboard 2, CPU 1 confirms that the new file name is not yet used with reference to the contents stored in the magnetic disc.

Next, the not-yet revised file name in the applicable recorded information is rewritten using the new file name, and the old file name before the change is written in not yet changed name storage area 48 (Refer to Figure 3). Furthermore, when the target optical disc to be revised is not currently mounted, bit "1" is set in a change request flag in the recorded information (Step S506 → S507 → S508 → S508-2).

When the optical disc is already mounted, the applicable file name and the pieces of related information in the optical disc and the hard disc are rewritten. In the present example, it is not necessary to mount the applicable optical disc on the optical disc recording/playback device when changing the file name and the optical disc identification name. When "1" is set, the directory information on the optical disc's side is revised automatically by an automatic revision processing program to be described later at the point when the applicable optical disc is mounted on optical disc recording/playback device 4.

In addition, when revision of the keyword information is instructed, the applicable keyword information is changed through a procedure similar to that for changing the file name through the procedure in S507 → S507-1. In addition, when revision of a disc name is instructed, pieces of recorded information that have the identification name before the revision are all extracted from the magnetic disc and rewritten using a new disc name as a matter of course.

Next, automatic optical disc revision processing will be explained.

If the processing for changing the aforementioned file name and the disc name is executed on the magnetic disc's side first without mounting the applicable optical disc, the control procedure makes a transition to the control procedure shown in Figure 10 every time an optical disc is mounted on optical disc recording/playback device 4 (Step S600 in Figure 5 → Step S601 in Figure 10).

Here, because a variety of methods in which a limit switch and a photosensor are used to detect the optical disc as it is placed at a prescribed position have been know, those widely know method may be utilized to detect the mounting of an optical disc.

Upon detecting the mounting of an optical disc, CPU 1 reads the disc name and the file names from the optical disc via optical disc recording/playback device 4 (Steps S601-602) and stores them in the register provided inside CPU 1.

Next, CPU 1 reads the recorded information which has "1" in the change flag from the magnetic disc via magnetic disc recording device 5 (Step S603).

Next, the file name before the change of said recorded information and the optical disc name are extracted. CPU 1 executes processing to determine whether or not the optical disc name before the change matches the current optical disc name stored in the internal register; whereby, it writes the changed disc name in the recorded information into storage area 52 (refer to Figure 4) of the optical disc in the form of an addition and changes the current identification name of the optical disc only when the decision is affirmative (Step S604 → S605).

Then, CPU 1 compares the file name which was read from the optical disc and stored in the internal register of CPU 1 with the file name read from the magnetic disc are compared in order to determine whether they match or not; whereby, it writes the file name to be changed to the applicable file name storage area of the optical disc only when the decision is affirmative (Step S606 → S607).

When processing for changing the disc name or the processing for changing the file name is completed, CPU 1 sets the change flag in the currently read recorded information to "0," which indicates the completion of the change, and writes it to the same address of the magnetic disc again (Step S608).

Subsequently, the next recorded information having "1" in the change flag is read, and processing for changing the disc name and processing for changing the file name on the optical

disc's side are executed through procedures similar to those described above (Steps S603-S609 → S603).

Once the optical disc name of the currently mounted optical disc and all the pieces of recorded information having "1" in their file name change flags are checked (Step S609), the control procedure returns to the initial state of Step S100 shown in Figure 5.

In the present application example, a disc name to be changed and file names to be changed can be registered with the magnetic disc without mounting the applicable optical disc on the optical disc recording/playback device. In this case, processing for revising the disc name and the file names is executed automatically at the point when the optical disc is mounted on the optical disc recording/playback device (Step S100 → S200 → S300 → S400 → S500 → S600 in Figure 5).

As such, there is no need for the operator to find the applicable optical disc at the storage location in order to revise its disc name and file names, but he/she only needs to input a change command from keyboard 2. Here, if a change of the identification name of the optical disc or a file name is registered with the hard disc while the optical disc is mounted, the disc identification name or the file name is revised on the optical disc's side at this point through the registration processing control procedure (Step S508-1 in Figure 9).

As explained above, in the present application example, pieces of management information of various kinds pertaining to general information (file information) recorded on optical discs are stored in a separate nonvolatile recording medium in order to execute keyword-based searches and automatic revision of disc names and file names.

In addition, even when an optical disc is damaged, the names of the files recorded on said disc can be found as long as the name of the disc is remembered.

The following applications of the present application example are feasible.

1) Although an example in which keyword information is used as a key to retrieve a file is shown in the present application example, a disc name may be used as a key. In this case, the disc name is handled as a part of the keyword information.

2) Although the present invention is implemented such that the keyword information is input directly from keyboard 2, the following embodiment is also feasible for keyword input. That is, many keywords are assigned in advance with numbers and stored in a read-only-memory (ROM) in the form of a table, and the aforementioned keyword table is displayed on CRT 3 when a keyword is to be input. Next, a desired keyword number is selected by moving the cursor of keyboard 2 in order to input the keyword. In this case, because the keyword information stored in the hard disc takes the form of numbers, the keyword information can be expressed using a code comprising several bits, so the number of bits used per 1 record can be reduced.

3) In the present application example, the change flag storage area in the magnetic disc is configured using 1 bit, and areas for storing a disc name and a file name are provided inside the hard disc. However, when the change flag is configured using 2 bits, and types of information to be changed are indicated by the change flag values, for example, "1" (decimal system) when the information to be changed is a disc name, "2" (decimal system) a file name is to be changed, and "3" (decimal system) when a disc name and a file name are to be changed, only 1 area is required for storing the applicable name(s) before the change, and that the file name and the disc name can be both stored in this storage area.

4) Although the keyword-based search is executed based on the information stored in magnetic disc recording device 5 in the present application, when backup information is stored in an optical disc, a keyword-based search can be performed based on the information stored in the optical disc even in the event of a failure of the magnetic disc recording device.

Effects of the invention

As explained above, according to the present invention, in the first embodiment of the present invention, because the name of the files containing general information are stored in the separate recording medium for management together with the applicable disc name, recording position information, and keyword information when recording input information on the optical disc, a file name can be found from said recording medium through a keyword-based search. As a result, there is no need to mount optical discs on the optical disc device every time a disc or a file needs to be found, so the work performed by the operator for this operation can be reduced significantly. In addition, because the recording position information stored in the recording medium is checked when reading recorded information, the recording position information can be read more quickly than when reading recording position information from a conventional optical disc, so that the recorded information can be read more quickly than with the conventional example.

In the second embodiment of the present invention, because the management information is stored in the optical disc as a backup copy, information storage stability can be further improved over the first embodiment.

In the third embodiment of the present invention, because the method of the first embodiment is implemented in the form of a device, wherein an optical disc information retrieval function is added to the optical disc recording device which was used for mere recording/playback of information in the past, a variety of searches can be performed without changing discs, so that the work performed by the operator for this operation can be reduced significantly.

In the fourth embodiment of the present invention, when a disc name on the recording medium for management is changed, the disc name of the optical disc itself is rewritten automatically when said optical disc is mounted, so that the operator no longer needs to find the applicable disc every time a disc name is changed.

Brief description of the figures

Figure 1 is a block diagram showing the basic configuration of an embodiment of the present invention.

Figure 2 is a block diagram showing a specific circuit configuration of an embodiment of the present invention.

Figure 3 is a memory map showing the address configuration of the magnetic disc of magnetic disc recording device 5 shown in Figure 2.

Figure 4 is a memory map showing the address configuration of the optical disc of optical disc recording/playback device 4 shown in Figure 2.

Figures 5-10 are flowcharts of procedures executed by CPU 1 shown in Figure 2.

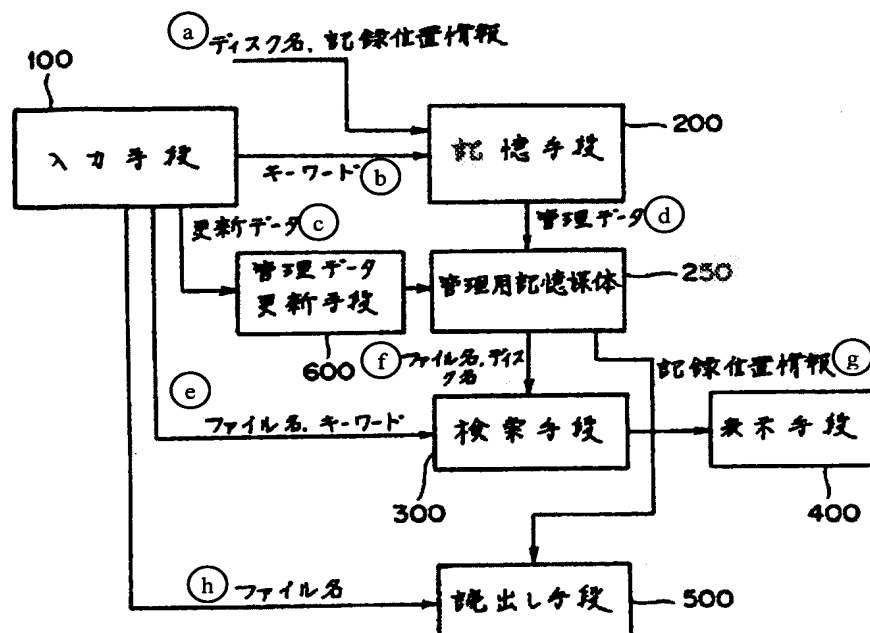| 1 | CPU |
2	Keyboard
3	CRT
4	Optical disc recording/playback device
5	Magnetic disc recording device
6	Interface

Figure 1: Block diagram of an embodiment of the present invention

Key:
a   Disc name, recording position information
b   Keyword
c   Updating data
d   File name, disc name
e   File name, keyword
f   File name
g   Management data
h   Recording position information
100   Input means
200   Recording means
250   Recording medium for management
300   Retrieval means
400   Display means
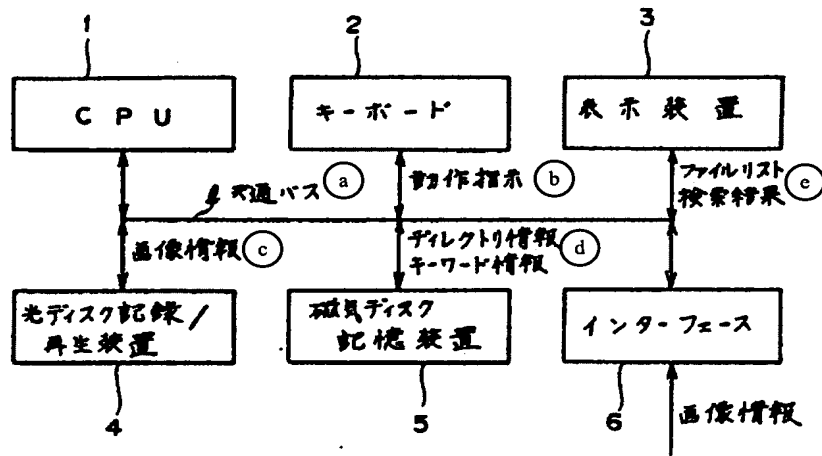500   Reading means
600   Management data updating means

Figure 2: Block diagram of an embodiment of the present invention

Key:
	a	Common bus
	b	Image information
	c	Operation command
	d	Directory information
		Keyword information
	e	File list
		Search result
	2	Keyboard
	3	Display device
	4	Optical disc recording/playback device
	5	Magnetic disc recording device
	6	Interface

Figure 3: Memory map of the magnetic disc of an embodiment of the present invention

Key:
	a	Address
	b	Second keyword
	41	File name

42   Disc name
43   Shooting date
44   File address
45   Size
46   First keyword
47   Change presence/absence information
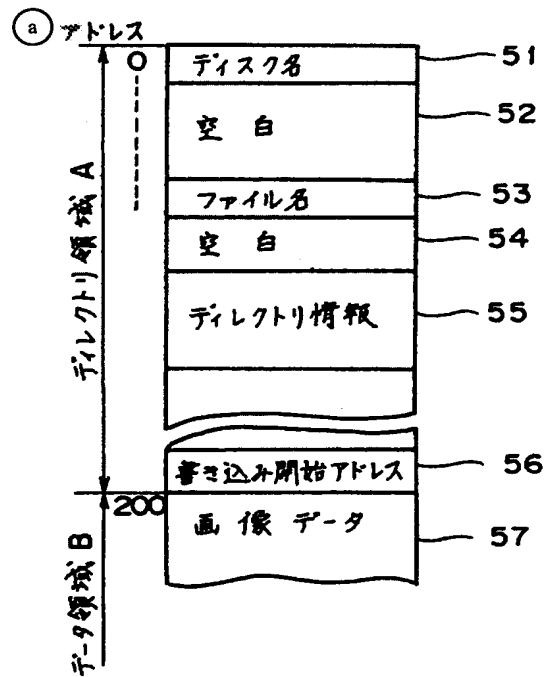48   File name before change and disc name

Figure 4: Memory map of the optical disc of an embodiment of the present invention

Key: a   Address
      A   Directory area
      B   Data area
      51   Disc name
      52, 54 Blank
      53   File name
      55   Directory information
      56   Write start address
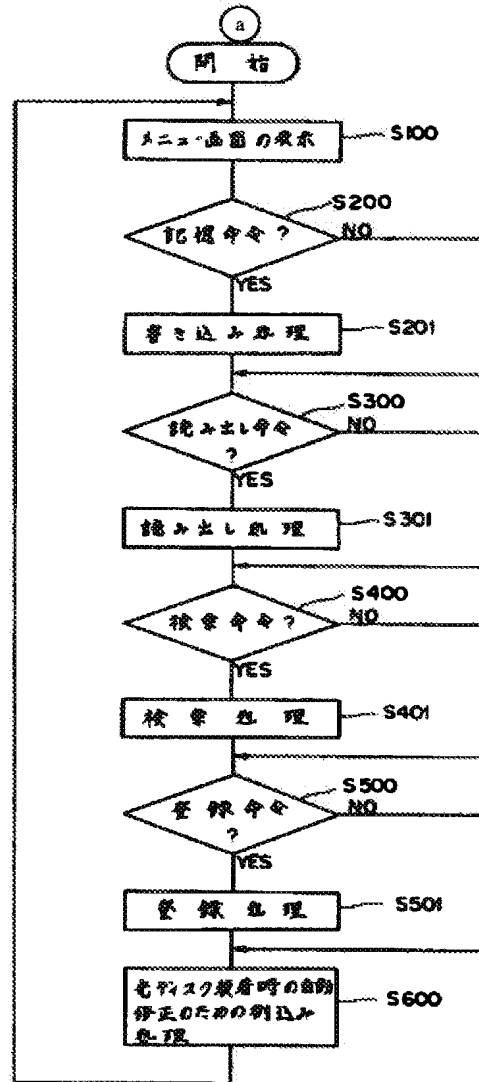   57   Image data

Figure 5: Flowchart of an embodiment of the present invention

Key: a   Start
      S100   Display the menu screen
      S200   Record command?
      S201   Write processing
      S300   Read command?
      S301   Read processing
      S400   Retrieval command?
      S401   Retrieval processing
      S500   Registration command?
      S501   Registration processing
      S600   Interrupt processing for automatic revision when optical disc is mounted
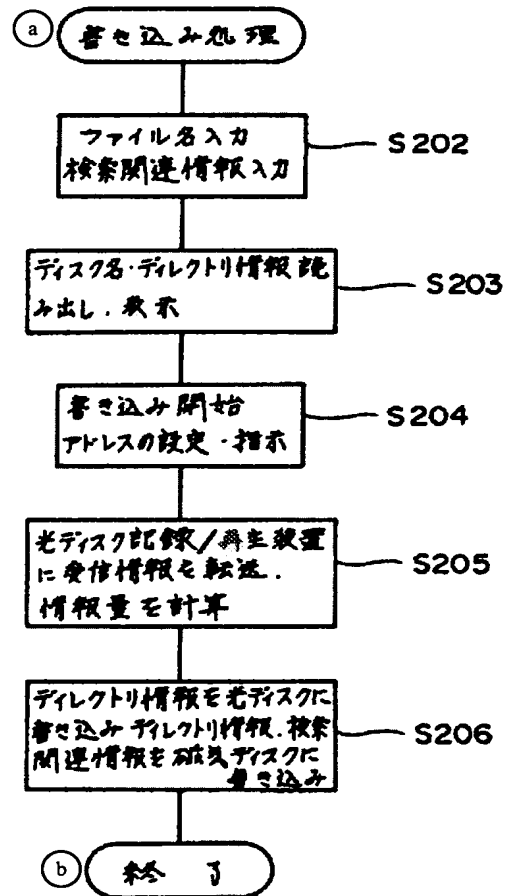
Figure 6: Flowchart of an embodiment of the present invention

Key: a   Write processing
        b   End
        S202 Input a file name
                  Input search-related information
        S203 Read and display the disc name and the directory information
        S204 Instruct to set a write start address
        S205 Transfer the received information to the optical disc recording/playback device, and calculate the information size
        S206 Write the directory information into the optical disc, and write the directory information and the search-related information into the magnetic disc
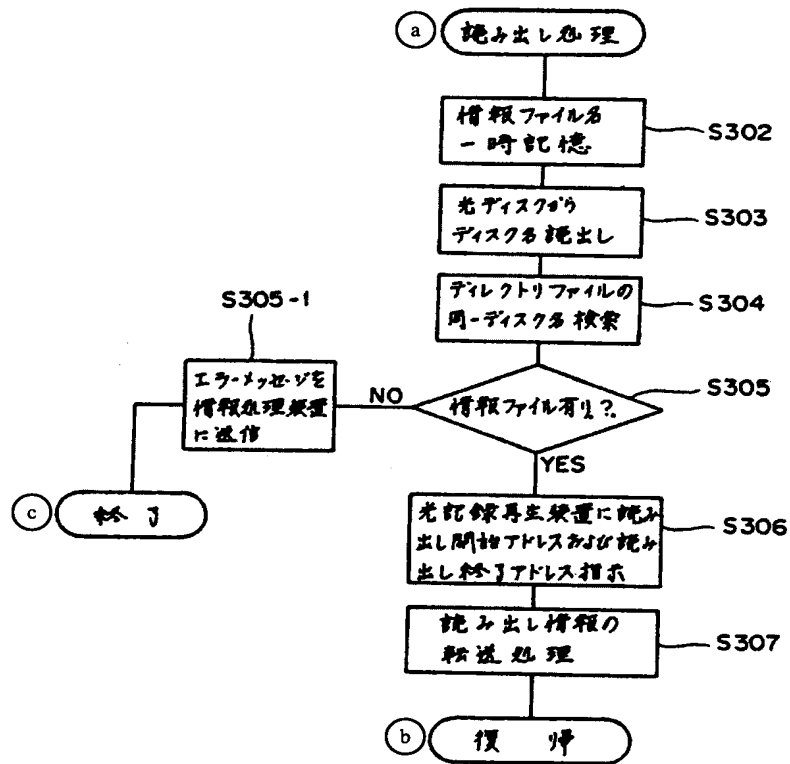
Figure 7: Flowchart of an embodiment of the present invention

Key: a   Read processing
      b   End
      c   Return
      S302   Store the information file name temporarily
      S303   Read the disc name form the optical disc
      S304   Find the same disc name in the directory file
      S305   Information file is present?
      S305-1 Send an error message to the information processor
      S306   Send a read start address and a read end address to the optical recording/playback
              device
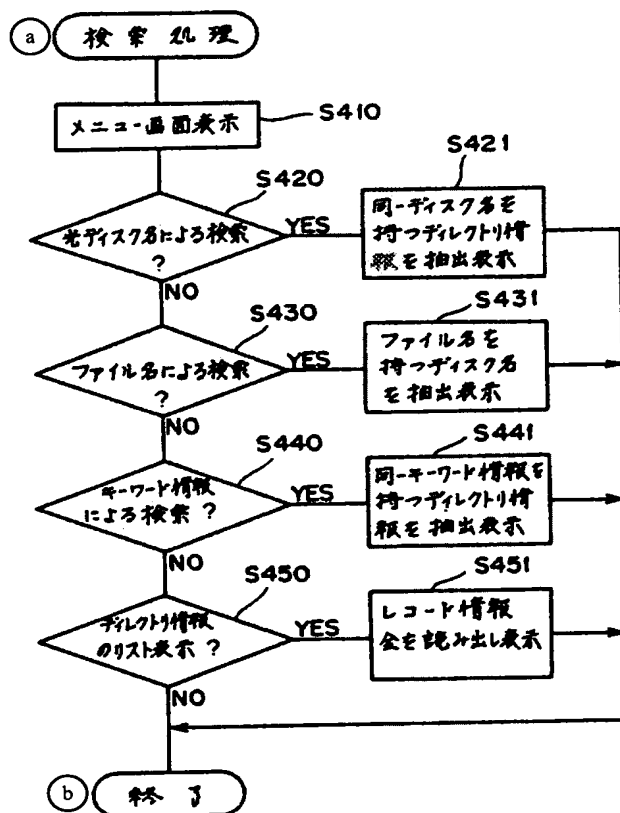   S307   Read information transfer processing

Figure 8: Flowchart of an embodiment of the present invention

Key: a   Retrieval processing
      b   End
      S410 Display the menu screen
      S420 Search using an optical disc name?
      S421 Extract and display the directory information with the same disc name
      S430 Search using a file name?
      S431 Extract and display the disc name with the [same] file name
      S440 Search using keyword information?
      S441 Extract and display the directory information with the same keyword information
      S450 Display the list of directory information?
      S451 Read and display all the recorded information
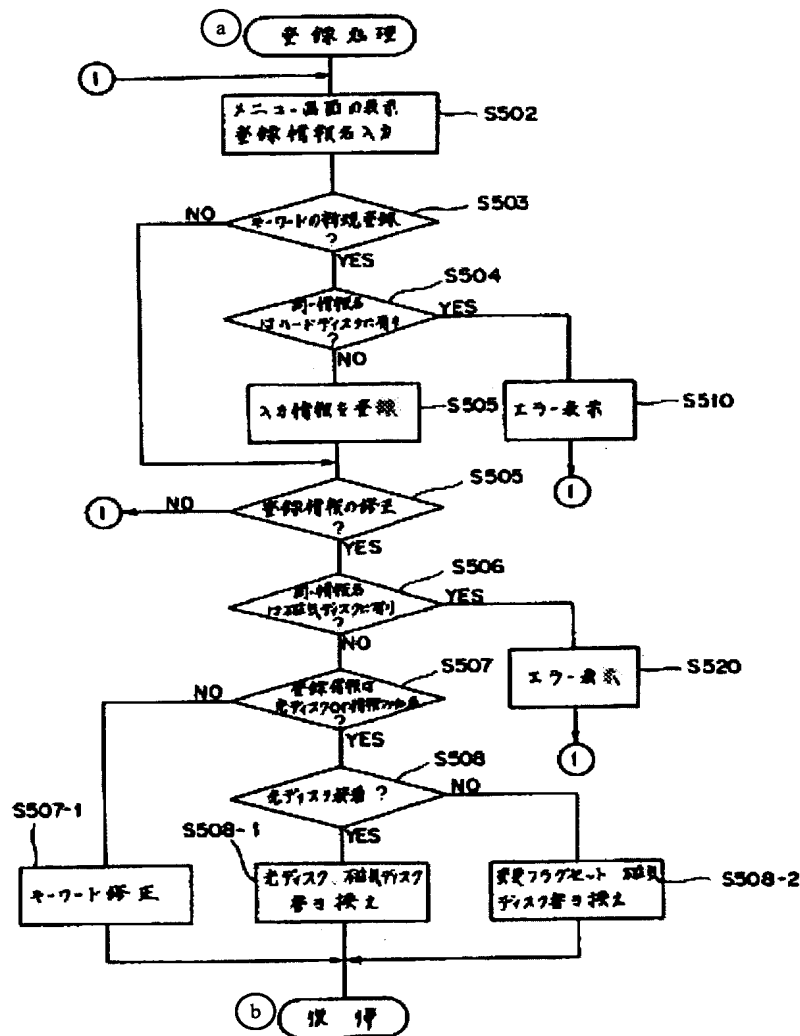
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Figure 9: Flowchart of an embodiment of the present invention

Key: a   Registration processing
      b   Return
      S502   Display the menu screen, and enter a registration information name
      S503   New registration of a keyword?
      S504   Same information name is present in the hard disc?
      S505   Register the input information
      S505'   Revise the registration information
      S506   Same information name is present in the magnetic disc?
      S507   The registration information is an optical disc name or an information file name?
      507-1   Revise the keyword
      S508   Optical disc mounted?
      S508-1   Rewrite the optical disc and the magnetic disc
      S508-2   Set the change flag, and rewrite the magnetic disc

S510, S520   Display error message
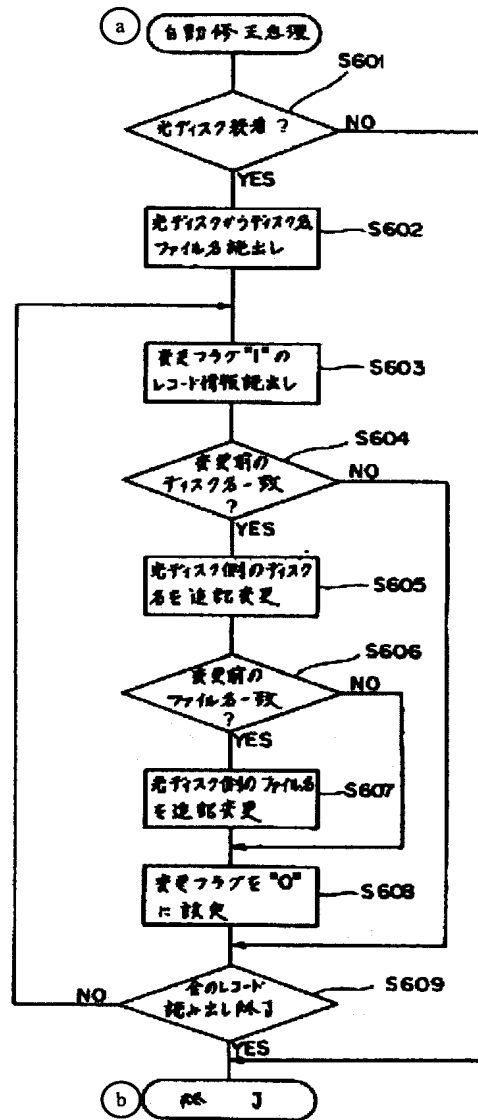

Figure 10: Flowchart of an embodiment of the present invention

Key: a   Automatic revision processing
        b   End
        S601   Optical disc mounted?
        S602   Read the disc name and file names from the optical disc
        S603   Read recorded information with "1" in the change flag
        S604, S606   Disc name before the change matches?
        S605, S607   Change the disc name on the optical disc's side as an addition

S608   Set the change flag to "0"
S609   Reading of all the records is completed